# Description

# WINDOW TYPE AIR CONDITIONER

## Technical Field

[1] The present invention relates to a window type air conditioner, and more particularly, to a window type air conditioner capable of lowering a temperature of a heat exchanger by collecting condensate water that flows down from a surface of the heat exchanger and thereby dispersing the condensate water to the surface of the heat exchanger.

## Background Art

[2] In general, an air conditioner an air conditioner is provided with a refrigerating cycle constituted with a compressor, a condenser, a capillary tube, a heat exchanger, etc., and properly supplies cool air generated from an evaporator and warm air generated from the condenser indoors according to the indoor condition, thereby maintaining the indoor circumstance comfortably.

[3] The air conditioner is divided into a window type air conditioner and a separated type air conditioner according to an installation method. The window type air conditioner is installed at the window, etc. under the state that an outdoor unit and an indoor unit are integrally assembled in one case, and the separate type air conditioner is respectively installed at the outdoor and the indoor under the state that the outdoor unit and the indoor unit are separated from each other.

[4] FIG. 1 is a disassembled perspective view showing a window type air conditioner in accordance with the conventional art.

[5] The conventional window type air conditioner comprises: a case 102 of which one side is positioned at the outdoor side and another side is positioned at the indoor side; an outdoor unit 104 installed at the outdoor side of the case 102 and heat-exchanged with the outdoor air; and an indoor unit 106 installed at the indoor side of the case 102 and heat-exchanged with the indoor air.

[6] The case 102 is installed at the wall that divides the outdoors and the indoors, and one side of the case 102 is positioned at the outdoor side and another side thereof is positioned at the indoor side. An outdoor air suction port 108 for sucking outdoor air is formed at both lateral surfaces of the case 102 positioned at the outdoor side. Also, an outdoor air discharge port 110 for discharging the air heat-exchanged while passing through the outdoor unit 104 outdoors is formed at the rear surface of the case 108. At the front surface of the case 108 positioned at the indoor side, an indoor air suction

port 112 for sucking the indoor air and an indoor air discharge port 114 for discharging the air heat-exchanged while passing through the indoor unit 106 indoors are respectively formed.

[7] The outdoor unit 104 is composed of: an outdoor heat exchanger 120 installed inside the case 102 positioned at the outdoor side and connected to a compressor 116 by a refrigerant pipe thus to be heat-exchanged with the outdoor air; and an axial fan 122 opposite to the outdoor heat exchanger 120 for generating a blowing force to suck the outdoor air and thus to discharge it to the outdoor heat exchanger 120.

[8] The case 102 positioned at the outdoor side is provided with a shroud 126 where the axial fan 122 and the outdoor heat exchanger 120 are mounted. The shroud 126 is provided with an orifice 128 for guiding air to the axial fan 122 for a smooth suction.

[9] The indoor unit 106 is composed of: an indoor heat exchanger 130 installed inside the case 102 positioned at the indoor side and connected to the compressor 116 by a refrigerant pipe 124 thus to be heat-exchanged with the indoor air; and a centrifugal fan 132 opposite to the indoor heat exchanger 130 for generating a blowing force to suck the indoor air and thus to discharge it to the indoor heat exchanger 130.

[10] An orifice 134 for guiding the air that has passed through the indoor heat exchanger 130 to the centrifugal fan 132 is formed between the indoor heat exchanger 130 and the centrifugal fan 132. An air guide 136 for guiding the air that has passed through the centrifugal fan 132 to the indoor air discharge port 114 is installed at the upper side of the centrifugal fan 132.

[11] A division plate 150 for dividing the outdoor unit 104 and the indoor unit 106 is installed inside the case 102, and a driving motor 152 for driving the centrifugal fan 132 and the axial fan 122 is mounted at the division plate 150.

[12] Operation of the window type air conditioner in accordance with the conventional art will be explained in more detail. When a power source is applied to the air conditioner, the compressor 116 and the driving motor 152 are driven thus to heat-exchange the outdoor air at the outdoor unit 104 and to heat-exchange the indoor air at the indoor unit 106.

[13] More specifically, when the centrifugal fan 132 is driven, the indoor air is sucked through the indoor air suction port 112 thus to be cooled while passing through the indoor heat exchanger 130. Then, the indoor air is discharged indoors through the indoor air discharge port 114.

[14] When the axial fan 122 is driven, the outdoor air is sucked through the outdoor air suction port 108 thus to be heat-exchanged while passing through the outdoor heat

exchanger 120. Then, the outdoor air is discharged outdoors through the outdoor air discharge port 110.

[15] At this time, condensate water is formed on a surface of the outdoor heat exchanger by a temperature difference, and the condensate water flows to a lower direction of the outdoor heat exchanger thus to be collected at a bottom surface of the outdoor side.

[16] However, according to the conventional window type air conditioner, in the outdoor heat exchanger, a refrigerant is heat-exchanged only by outdoor air blown by the axial fan thus to degrade a heat exchanging efficiency.

## Disclosure

[17] Therefore, it is an object of the present invention to provide a window type air conditioner capable of enhancing an efficiency of a heat exchanger by cooling the heat exchanger by dispersing condensate water that drops from a surface of the heat exchanger thus to be collected at a bottom of a case to the surface of the heat exchanger.

[18] Another object of the present invention is to provide a window type air conditioner capable of enhancing a function of a heat exchanger by forming a condensate water guide at an inner surface of a shroud and thus by guiding condensate water dispersed to the inner surface of the shroud to the heat exchanger.

[19] To achieve these objects, there is provided a window type air conditioner comprising: a case of which one side is positioned at an indoor side and another side is positioned at an outdoor side; an outdoor heat exchanger mounted inside the case positioned at the outdoor side thus to be heat-exchanged with the outdoor air; an axial fan opposite to the outdoor heat exchanger and blowing outdoor air by a centrifugal force; a condensate water dispersing unit for dispersing condensate water collected at a lower portion of the case to a surface of the outdoor heat exchanger; and a shroud in which the outdoor heat exchange is mounted, wherein the shroud is provided with a condensate water guide for guiding condensate water dispersed to an inner surface of the shroud by the condensate water dispersing unit to the outdoor heat exchanger.

[20] The condensate water dispersing unit is installed at the axial fan, and is rotated with the axial fan as a ring type.

[21] The condensate water guide is constructed as guide grooves formed at both lateral surfaces of the shroud with the same interval. The guide groove is downwardly inclined towards the outdoor heat exchanger.

[22] The condensate water guide is constructed as a guide protrusion protruded at both

lateral surfaces of the shroud in a vertical direction with the same interval. The guide protrusion is downwardly inclined towards the outdoor heat exchanger, and the end portion thereof is in contact with the surface of the heat exchanger.

[23] The condensate water guide has an inclination surface formed at an upper surface of the shroud so as to guide condensate water dispersed to the upper inner surface of the shroud to the outdoor heat exchanger.

## Description of Drawings

[24] FIG. 1 is a disassembled perspective view showing a window type air conditioner in accordance with the conventional art;

[25] FIG. 2 is a sectional view showing a window type air conditioner according to one embodiment of the present invention;

[26] FIG. 3 is a perspective view showing a shroud of the window type air conditioner according to one embodiment of the present invention;

[27] FIG. 4 is a sectional view showing an operational state of an outdoor unit of the window type air conditioner according to one embodiment of the present invention;

[28] FIG. 5 is an enlargement view of 'A' part of FIG. 4;

[29] FIG. 6 is a perspective view showing a shroud of the window type air conditioner according to a second embodiment of the present invention;

[30] FIG. 7 is a perspective view showing a shroud of the window type air conditioner according to a third embodiment of the present invention;

[31] FIG. 8 is a sectional view showing an operational state of an outdoor unit of the window type air conditioner according to a third embodiment of the present invention; and

[32] FIG. 9 is an enlargement view of 'B' part of FIG. 8.

## Best Mode

[33] Hereinafter, a window type air conditioner according to the present invention will be explained with reference to the attached drawings.

[34] Even if a plurality of preferred embodiments can exist in the present invention, the most preferred embodiment will be explained hereinafter.

[35] FIG. 2 is a sectional view showing a window type air conditioner according to one embodiment of the present invention, FIG. 3 is a perspective view showing a shroud of the window type air conditioner according to one embodiment of the present invention, FIG. 4 is a sectional view showing an operational state of an outdoor unit of the window type air conditioner according to one embodiment of the present invention, and FIG. 5 is an enlargement view of 'A' part of FIG. 4.

[36] The window type air conditioner according to the present invention comprises: a case 10 formed at the wall that divides the indoor side and the outdoor side; an indoor unit 20 positioned at the indoor side of the case 10 thus to be heat-exchanged with the indoor air; an outdoor unit 30 positioned at the outdoor side of the case 10 thus to be heat-exchanged with the outdoor air; a compressor 40 for compressing a refrigerant; etc.

[37] One side of the case 10 is positioned at the indoor side and another side thereof is positioned at the outdoor side. A division plate 42 for dividing the indoor unit 20 and the outdoor unit 30 is installed in the case 10, and a driving motor 44 is mounted at the division plate 42.

[38] An indoor air suction port 12 for sucking the indoor air and an indoor air discharge port 14 for discharging the air that has been heat-exchanged while passing through the indoor unit 20 indoors are separately formed up and down at the front surface of the case 10 positioned at the indoor side. Also, an outdoor air suction port 16 for sucking the outdoor air is formed at both lateral surfaces of the case 10 positioned at the outdoor side, and an outdoor air discharge port 18 for discharging the air that has passed through the outdoor unit 30 outdoors is formed at the rear surface of the case 10.

[39] The indoor unit 20 is composed of: an indoor heat exchanger 22 for passing the indoor air and thereby cooling; and a centrifugal fan 24 opposite to the indoor heat exchanger 22 and connected to one side of the driving motor 44, for generating a blowing force so that the indoor air sucked into the indoor air suction port 12 can pass through the indoor heat exchanger 22.

[40] An orifice 28 for a smooth air flow is formed between the centrifugal fan 24 and the indoor heat exchanger 22. An air guide 46 for guiding the air that has passed through the centrifugal fan 24 to the indoor air discharge port 14 is formed at the upper side of the shroud 26.

[41] The outdoor unit 30 is composed of: an outdoor heat exchanger 32 connected to the compressor 40 by a refrigerant pipe and heat-exchanged by the outdoor air; an axial fan 34 opposite to the outdoor heat exchanger 32 and connected to another side of the driving motor 44, for generating a blowing force to blow the outdoor air sucked into the outdoor air suction port 16 to the outdoor heat exchanger 32; and a shroud 36 having the outdoor heat exchanger 32 therein and separating a suction side of air blown by the axial fan 34 from a discharge side.

[42] The axial fan 34 is provided with a condensate water dispersing unit 50 for lifting

up condensate water collected at a lower surface of the case 10 and thereby dispersing to the surface of the heat exchanger 32.

[43] The condensate water dispersing unit 50 is integrally formed at the end of a blade of the axial fan 34 as a ring type, and is rotated together with the axial fan 34 thus to disperse condensate water collected at the lower surface of the case 10 to the outdoor heat exchanger 32.

[44] The shroud 36 is provided with an orifice 38 for sucking outdoor air and attenuating a velocity vector of the outdoor air in a radius direction due to a characteristic of the axial fan 34 at the front surface thereof. The rear surface of the shroud 36 is open so that the outdoor air that has passed through the outdoor heat exchanger 32 can be discharged through the outdoor air discharge port 18. The shroud 36 is formed as a hexahedral shape in which the outdoor heat exchanger 32 is mounted.

[45] A condensate water guide for guiding condensate water dispersed to both lateral surfaces 52 of the shroud 36 by the condensate water dispersing unit 50 to the outdoor heat exchanger 32 is formed at both inner surfaces of the shroud 36.

[46] That is, condensate water lifted up as the condensate water dispersing unit 50 is rotated together with the axial fan 34 is dispersed not only to the surface of the outdoor heat exchanger 32 but also to the inner lateral surface of the shroud 36 where the outdoor heat exchanger 32 is mounted. The condensate water dispersed to the inner lateral surface of the shroud 36 is guided to the outdoor heat exchanger 32 by the condensate water guide and flows down along the surface of the outdoor heat exchanger 32 thereby lowering temperature of the outdoor heat exchanger 32.

[47] The condensate water guide is constructed as guide grooves 56 formed at both lateral surfaces of the shroud 36 with the same interval. The guide groove 56 is downwardly inclined towards the outdoor heat exchanger 32 from the axial fan 34, and the end thereof is in contact with the outdoor heat exchanger 32.

[48] The guide groove 56 is formed as a curved line shape that one end adjacent to the outdoor heat exchanger 32 is positioned at a lower side than another end adjacent to the axial fan 34 so that condensate water dispersed to the lateral surface of the shroud can flow down.

[49] The condensate water guide is constructed as guide protrusions (not shown) protruded at both lateral surfaces 52 of the shroud 36 with the same interval and guiding condensate water like the aforementioned guide groove 56.

[50] FIG. 6 is a perspective view showing a shroud of the window type air conditioner according to a second embodiment of the present invention.

[51] The shroud according to the second embodiment of the present invention is constituted with a guide groove 60 formed at the upper inner surface of the shroud and guiding condensate water dispersed to the upper inner surface of the shroud to the outdoor heat exchanger.

[52] The guide grooves 60 according to the second embodiment are formed as a curved line shape with the same interval in a horizontal direction at the upper inner surface of the shroud 36, thereby guiding condensate water dispersed to the upper surface of the shroud 36 to the outdoor heat exchanger 32.

[53] Operation of the window type air conditioner according to the present invention will be explained as follows.

[54] When a power source is applied to the air conditioner, the compressor is driven thus to circulate a refrigerant and to drive the centrifugal fan 24 and the axial fan 34.

[55] At this time, the indoor unit 20 is operated as follows. As the centrifugal fan 24 is driven, the indoor air is sucked into the case 10 positioned at the indoor side through the indoor air suction port 12 formed at the lower side of the front surface of the case 10 thus to be cooled while passing through the indoor heat exchanger 22. The cooled air is guided by the air guide 46 thus to be discharged indoors through the indoor air discharge port 14 formed at the upper side of the front side of the case 10.

[56] Also, the outdoor unit 30 is operated as follows. As the axial fan 34 is driven, the outdoor air is sucked into the case 10 positioned at the outdoor side through the outdoor air suction port 16 formed at both lateral surfaces of the case 10 thus to be heat-exchanged while passing through the outdoor heat exchanger 32. The heat-exchanged air is discharged outdoors through the outdoor air discharge port 18 formed at the rear side of the case 10.

[57] Herein, the condensate water dispersing unit 50 mounted at the axial fan 34 disperses condensate water contained at the lower portion of the case 10 to the surface of the outdoor heat exchanger 32 while being rotated together with the axial fan 34, thereby lowering temperature of the outdoor heat exchanger 32.

[58] At this time, the condensate water dispersed by the condensate water dispersing unit 50 is dispersed not only to the surface of the outdoor heat exchanger 32 but also to the inner lateral surface of the shroud 36. The condensate water dispersed to the inner lateral surface of the shroud 36 flows down along the condensate water guide formed as the guide groove 56 or the guide protrusion thus to contact the surface of the outdoor heat exchanger 32, thereby lowering the temperature of the outdoor heat exchanger 32 and thus enhancing the function of the outdoor heat exchanger 32.

[59] FIG. 7 is a perspective view showing a shroud of the window type air conditioner according to a third embodiment of the present invention, FIG. 8 is a sectional view showing an operational state of an outdoor unit of the window type air conditioner according to a third embodiment of the present invention, and FIG. 9 is an enlargement view of 'B' part of FIG. 8.

[60] The shroud 36 according to the third embodiment is provided with an inclination surface 70 inclined towards the outdoor heat exchanger 32 at an upper surface thereof in order to guide condensate water dispersed to the upper inner surface thereof to the surface of the outdoor heat exchanger 32.

[61] That is, the inclination surface 70 has an inclination angle of $\alpha$ in order to guide condensate water dispersed to the upper inner surface of the shroud 36 to the outdoor heat exchanger 32.

[62] In the window type air conditioner according to the third embodiment of the present invention, the condensate water dispersing unit 50 is rotated as the axial fan 34 is rotated, and thereby condensate water is dispersed to the surface of the outdoor heat exchanger 32 and to the upper inner surface of the shroud 36. The condensate water dispersed to the upper inner surface of the shroud 36 flows down along the inclination surface 70 formed at the upper surface of the shroud 36 and contacts the surface of the outdoor heat exchanger 32, thereby lowering the temperature of the outdoor heat exchanger 32.

[63] In the window type air conditioner according to the present invention, the guide groove or the condensate water guide, the guide protrusion is formed at the inner side surface of the shroud, thereby guiding condensate water dispersed into the inner side surface of the shroud to the outdoor heat exchanger. According to this, the dispersed condensate water is directly in contact with the surface of the outdoor heat exchanger, thereby lowering the temperature of the outdoor heat exchanger and thus enhancing the function of the heat exchanger.

[64] It will be apparent to those skilled in the art that various modifications and variations can be made in the present invention without departing from the spirit or scope of the invention. Thus, it is intended that the present invention cover modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.